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## BLOG-POST FOR CYBORGS

GENERICSCIENCE, MASHINES, PHILOFICTION CYBORG, FEMINISM, HARAWAY

We are all cyborgs now. To the point where this reality no longer appears at all striking. As so perfectly pictured in Alex Rivera's film *Sleepdealer* (2008), we are biological machines strapped to information machines which together function as war machines. It is remarkable how much of our cyborg existence Donna Haraway anticipated. In this essay, I want simply to extract some pertinent themes from four of her books and from an extended interview conducted by Thyrza Nichols Goodeve. I will stress her connection to Marxist thought, not to deny her significance as a feminist writer, but to supplement it.

Donna Haraway was born in the forties, trained as a biologist, and radicalized during the Vietnam war years. Lodged at the History of Consciousness program at the University of California, Santa Cruz in 1980, Haraway is, on her own admission, a product of both cold war techno-science and the struggle in and against its imperial consequences.

One thing that distinguishes Haraway from many other progressive intellectuals of her time is that her background is in the sciences rather than the humanities or social sciences. While she occasionally makes use of Marcuse, I think a more profound influence on her work is that of Joseph Needham, the English Marxist biologist, to whom she devoted a fair chunk of her doctoral thesis and subsequent first book. Needham might stand in here for a lost tradition of intersections between critical theory and the natural sciences, whether of a Marxist or feminist bent.

Feminism diverted her from the life sciences. Haraway: "Feminists re-appropriate science in order to discover and to define what is 'natural' for ourselves. A human past and future would be placed in our hands. This avowedly interested approach to science promises to take seriously the rules of scientific discourse without worshipping the fetish of scientific objectivity." (SCW23)

Science? Technology? Goddess preserve us! There are plenty of feminisms that try to take their stand against techno-science from without. Haraway: "Feminist theory has repeatedly replicated this 'naturalizing' structure of discourse in its own oppositional constructions." (PV257) A useful attribute of feminist science studies is that it tends not to make the assumption that there is something inherently radical about philosophy, or culture, or play or poetry over and against the scientific and technical. It does not take sides in advance within the existing intellectual division of labor.

It is, among other things, a practical critique of that division of intellectual labor. "Destabilizing the positions in a discursive field and disrupting categories for identification might be a more powerful feminist strategy than 'speaking as a woman.'" (PV310) It retains a sort of double discomfort, asking critical questions in a scientific zone, and speaking knowledgeably about actual sciences in a humanities zone.

This is irritating, and usefully so. Feminist science studies persistently recasts the objectivity claims of the sciences, and does so, to make it worse, without dismissing the scientific endeavor. This is irritating in another way as well. Haraway: "Marx insisted that one must not leap too fast, or one will end up in a fantastic utopia, impotent and ignorant. Abundance... is essential to the full discovery and historical possibility of human nature. It matters whether we make ourselves in plenty or unfulfilled need, including need for genuine knowledge and meaning." (SCW68).

There can be no retreat into the superstructures when there is no food, shelter or safety. The production and reproduction of our species-being, whatever it may be, has to be a central concern of any critical knowledge. Given the rising inequality, poverty and hunger in twenty-first century California, to which the state has responded by mirroring its great universities with a series of equally great prisons, questions of material need return at the heart of the empire.

Haraway's California is that part that is still a land of surplus, where some more complex questions about food arise other than its insufficiency. Haraway tells some archetypal California stories about food. One involves a religious studies professor who prepares a meal for the department party, the centerpiece of which is a feral pig he shot with an arrow. Complex debates ensue about ritual, ethics, impossible ecologies, and so on.

Such stories are like metonymic fragments of Marx's metabolic rift. Molecules – in this case proteins – lack enclosing loops back through any sort of dynamic equilibrium. Haraway eschews any easy answers on either of these questions, and makes a wry nod to "the contradictory, thick quality of what we mean when we say 'California.'" (HLL42)

They are all the same real questions. Here in a contemporary, ramified form, is what Alexander Bogdanov called the **tragedy of the totality**, a vast yet molecular process that only reveals its contours when something goes wrong, when there is a metabolic rift, of which there are now many, from feral pigs to feral carbon.

Haraway has on occasion described herself as an illegitimate daughter of Marx, and "something of an unreconstructed and dogged Marxist." (MW8) She remains attentive to how relations congeal into apparently natural things. "Property is the kind of relationality that poses as the thing-in-itself, the commodity, the thing outside relationship, the thing that can be exhaustively measured, mapped, owned, appropriated, disposed." (MW134) As we shall see, this becomes in her work a useful starting point for understanding how distinctly twenty-first century modes of property and technology are organized.

Unlike many other Marxists, Haraway insists on including nonhuman actors in what would be an otherwise relentlessly human category of that-which-labors. "The actors are not all 'us.'" (HR66) Techno-science explodes the already wobbly partition between object and subject, nature and culture, apparatus and labor.

Marx may have shown how the commodity is full of labor, but the categories of chimerical objects, those mash-ups of flesh-tech, has much expanded, even if there is still a tendency for the fetish of the thing to obscure the relations of its making. Hence the world can now appear as a vast accumulation not just of commodities or spectacles but of 'big data' or 'selfish genes.'

Haraway tries to keep in view the relations of production that the fetish of the commodity obscures. "I believe wealth is created by collective practice, figured by Marx as labor, but needing a messier metaphoric descriptive repertoire." (MW94) There is a fetishism in Marx of labor itself – man-with-hammer – that needs attending to as well. If one takes the labor point of view to be what is central to Marx's work, then what, in the age of techno-science, might now constitute such a point of view?

If Marx proceeded through a critique of the dismal science of political economy, Haraway works through a rather more lively if no less difficult science – biology. "I have always read biology in a double way – as about the way the world works biologically, but also about the way the world works metaphorically." (HLL24) One of the many functions of biology is defining the limits of what can be said about the potentials of the human, about our species-being. Is there a 'human race', or are some races not fully human? And if all races are human, what might the human become?

It is not that biology is reducible to culture and politics. Rather, "the material-semiotic tissues are inextricably intermeshed." (MW218) Haraway expands the object of critique from political economy to the life sciences, which are no less implicated in the production of the infrastructural givens of the contemporary commodity-world. This adds an essential dimension, if critique is going to grasp – such a primate metaphor! – Marx's no less full-bodied metaphor of metabolic rift, and flesh it out.

There have been three **basic metaphors** of causality of the human in the modern period: race, population and gene. Each has its dissenters, critics and utopian or dystopian writers. Each has its genuine scientists caught up in substitutions drawn from social organization which color and overshoot the process of producing evidence. Each also has its ideologues and moral entrepreneurs.

*Racecausality* held that accumulated cultural differences are somehow carried in the blood. Even among progressives, the very category of race could create a fear of race mixing. Haraway: "The evolution of language, the progress of technology, the perfection of the body, and the advance of social forms seemed to be aspects of the same fundamental human science. That science was constitutively physiological and hierarchical, organismic and holist, progressivist and developmental!" (MW233)

A common response is a welter of attempts to categorize and characterize the races, arranged in some sort of hierarchy. Differences of culture or power become expressions of an order of nature. Haraway: "No wonder universal nature has been a less than appealing entity for those who were not its creators and its beneficiaries." (MW237)

To which one might add that the temptation to overcome a supposed biological destiny of race, by severing the social from biological being altogether, is and remains a powerful temptation. It has the unfortunate side effect of cutting critical thought off from thinking biology as a techno-science with powerful and perhaps increasing abilities to create new unequal relations for the production and reproduction of life.

While popular racialism lives on, the substituting of racial for other kinds of difference did not survive in biological science. In the postwar years, after the debacle of racialized Nazi biology, and in the wake of new research methods, the basic metaphor of *populationcausality* arose in its place. A population is a semi-permeable group within a species. There may be as much variation within a population as between. Each may nevertheless be a pool which contain adaptations that are more or less successful.

Populations are not types in a hierarchy; nor are they sets. Each is constantly in flux in changing environments. The metaphysical shift is from a hierarchy of self-same types, where miscegenation at the boundary produces less viable instances, towards a different way of figuring difference and similarity. Populations are internally differentiated but formally equivalent in relation to each other.

Population became a central figure in the modern synthesis, which brought together naturalists, geneticists and experimentalists in a new kind of biological science and culture. Haraway: "This was a scientific humanism that emphasized flexibility, progress, cooperation, and universalism." (MW238) It broke with the language of race and blood. It stressed the flexible and plastic nature of the human condition, and its capacity to change through education. The human can be socially self-constructing. Actual differences in power, such as the colonial relation, are elided by what ought to be: the 'family of man.'

The organizational challenges of post-war capitalism put on the agenda the question of the limits to the adaptive nature of the human. Primate studies became a way of conducting experiments and building theories aimed at the adaptation of the human to the rising complexity of technics and organization.

Primate researchers focused on two linked topics: sex and dominance. The male primate fights with other males for access to reproduction. Alongside interest in observing primates in their 'natural' setting, were experiments on the primate as an embodiment of drives to sex and power, to see how adaptable its species-being was to the office politics of living in cages and pressing levers for food.

The primate was an experimental subject who could yield insights into techniques for regulating sexuality and power in the modern world for human primates too. Rather than repressing desire or the will to power, technologies and therapies could help the human primate adapt. It's a small step from the study of primate behaviors to the hormones that supposedly regulate them, and then on to the construction of a techno-science of intervening in the hormonal regulation of primate sexuality – particularly that of humans. The contraceptive pill is here the great techno-science success story.

Population causality naturalized the patriarchal family. Its origin myth is of man the hunter. It is man who is assumed to be the maker of tools, the inventor of elaborated social organization and hence of language. It is man who is curious, who explores, while woman is home yanking yams from the dirt with babies on her teats. This figure was supplemented rather belatedly by woman the gatherer, in some cases as a result of the work of feminist researchers.

Haraway has paid particularly close attention to the role of field studies of natural primate populations in legitimating some elements of the family of man story. The figures of the headman, the sexual division of labor, woman as burdened by children, all pass back and forth from science to culture as substituted figures. Through a study of the basic metaphor of biological economy, Haraway hones her critique on the foundations of postwar American liberalism.

That liberalism's finest hour was its efforts to overcome, in both science and culture, the benighted effects of the category of race. Haraway wants to push on from that self-congratulatory ethos. "I believe that this capacity of reproducing the Same, in culpable innocence of its historical, power-charged specificity, characterizes not just me but people formed like me, who are liberal, scientific, and progressive..." (MW242)

The problem with the liberal family of man is that "what's not collected in a reproductive family story does not finally count as human. For all the... emphasis on difference, this is the grammar of indifference, or the multiplication of sameness." (MW242) A functional causality reigns: that which survives is functional; that which is functional survives.

The liberal family of man gave way to the neoliberal 'selfish gene' of socio-biology, and the basic metaphor of *gene causality*. The population regime took as its units of thought individual bodies and their social groups. The gene becomes the controlling code which uses both bodies and groups for its own ends. The causal metaphor is still functional, but the unit to which it applies is now molecular: The gene that survives is functional because the function of the gene is to survive. "My genes, my self, my investment, my future. It's much more strictly capitalist." (HLL152)

Such a science is the product not only of a certain naturalizing of the exchange economy, but also of powerful technologies which produce the gene itself as an artifact in a database. Haraway: "something peculiar happened to the stable, family-loving, Mendelian gene when it passed into a database..." (MW244)

The gene becomes one of the units of currency of the era of 'big data'. Genomics and informatics merge. The gene can exist in a variety of media, from software to wetware, and some in between. Nature starts to yield not the authoritarian causality of race hierarchies or patriarchal families, but the exchange causality of property in a purified form.

The genetic database is at once about the genes of specific individuals, but also sub-units of that code, and at the other extreme, about our species-being. The design of such a database shapes what can be compared, what kinds of labor can most easily be performed, but meanwhile the gene becomes a thing separated from a totality and accorded its own agency. Meanwhile sub-disciplines of biological science, such as genetics or population biology, start to fork off and coalesce around much more differentiated apparatus, practices and objects of knowledge.

The construction of the gene as an object of techno-science is just one component in an important shift in the practices of substitution between organizational levels. Haraway: "Nineteenth century scientists materially constituted the organism as a laboring system, structured by a hierarchical division of labor, and an energetic system fueled by sugars and obeying the laws of thermodynamics. For us, the living world has become a command, control, communication, intelligence system... in an environment that demands strategies of flexible accumulation. Artificial life programs, as well as carbon-based life programs,

work that way. These issues are about metaphor and representation, but they are about much more than that." (MW97)

Ideology is productive. The shift from thinking organization as energy systems alone to a combination of energy and information systems, enables not only new kinds of science, and technology, and power, but also opens up a space for their critique. Interestingly, some of the new modes of substitution producing both ideology and knowledge might no longer be metaphorical so much as algorithmic, a kind of software (Manovich) and database (Azuma) model of knowledge.

Haraway sees genetic code and computer code as a new kind of fetishism that are partly, but not entirely, legible to the old Marxist and Freudian versions. One might call it the fetish of the program, a new kind of **code causality**, of which gene causality is but one instance. It is not entirely reducible to either authoritarian or exchange causality, although it has features of both.

By way of illustration, Haraway points to an issue of *Mamalian Genome* journal which offered its readers a representation of the contents of the chromosomes of a mouse, under the headline, "the Complete Mouse (some assembly required)." (MW98) Code becomes the master layer in the stacked protocols by which an organization is managed. In genetics, code becomes the part via which a whole can be reductively understood. In place of messy bodies, the clean execution of command and control, although as we shall see there are code-based sciences where such a reduction is not easily made.

Commodity fetishism is when relations between people take on the features of relations between things. Collective labor is what hides behind of the commodity. But perhaps it is not so easy to separate labor and thing. Haraway wants to broaden the fetish concept a little. "Curiously, fetishes – themselves 'substitutes', that is, tropes of a special kind – produce a particular 'mistake'; fetishes obscure the constitutive tropic nature of themselves and of worlds." (MW136) A fetish is a naturalizing of the very thing whose 'nature' needs calling into question, but while it may be limiting, it may like ideology be peculiarly productive: "There are amazingly creative aspects to commodity fetishism." (HLL92)

Gene technology is implicated in commodity fetishism, but maybe also in "another and obliquely related flavor of reification that transmutes material, contingent, human and nonhuman liveliness into maps of life itself and then mistakes the map that its reified entities for the bumptious, nonliteral world." (MW135) Haraway's détournement of the fetish repurposes it.

Rather than the commodity fetish, she asks about the **corporeal fetish**. How do bodies appear as autonomous things against a background of invisible non-bodies? In commodity fetishism, the apparent world of things, governed by the code of exchange value, obscures social relations among people and the production of use value. In corporeal fetishism, the apparent world of bodies, governed by the code of the gene, obscures the tangle of both human and nonhuman processes that produce life.

In corporeal fetishism, the gene becomes a source of value as a kind of thing-itself, or perhaps code-itself. "So the fetishist sees the gene itself in all the gels, blots, and printouts in the lab, and 'forgets' the natural-technical processes that produce the gene and genome as consensus objects in the real world." (MW146)

An abstraction replaces the concrete; the map becomes the territory. "Gene fetishists 'forget' that the gene and gene maps are ways of enclosing the commons of the body – of corporealizing – in specific ways, which, among other things, often put commodity fetishism into the program of biology at the end of the Second Millennium." (MW148)

Just as the commodity fetish makes all things property to be exchanged, so too the corporeal fetish makes all of life a thing to be commodified through ownership of its code. "Genomics 'globalizes' in specific ways. Species-being is materially and semiotically produced in gene-mapping practices, just as particular kinds of space and humanity were the fruit of earlier material-semiotic enclosures." (MW163) Private property produces the split between commodities and the labor that makes it; Intellectual property produces the split between the gene and the organism that makes it.

What was in Needham's day biology's commons of research materials becomes increasingly commodified. The 'mutation' of the private property form into strictly controlled 'intellectual property' makes whole new classes of things available for commodification. "Like the stigmata of gender and race, which signify asymmetrical, regularly reproduced processes that give some human beings rights in other human beings that they do not have in themselves, the copyright, patent and trademark are specific, asymmetrical, congealed processes – which must be constantly revived in law and commerce as well as in science." (MW7) Intellectual property grounds a new kind of class power.

A patent defines what is nature and what is not. An artifact of 'nature' cannot be patented. For that to happen, nature has to be mixed with labor. Patent is a site of struggle over what counts as subject and what as object. Haraway's famous example is DuPont's OncoMouse, the first patented mammal, specifically engineered for the study of breast cancer. (And now itself an obsolete, discontinued 'product').

All sorts of organisms are now integrated into a strange techno-nature meant to support human life, or at least those parts of it that can be commodified. Not only mice but dogs and all sorts of other beings are our 'companions' within techno-science. In place of the liberal-humanist family, quite another kind: "the technoscientific family is a cyborg nuclear unit, "now that "life as a system to be managed." (MW152)

What kind of critical agency is possible in the world of OncoMouse? Do lab rats belong to the working class? Should battery hens be unionized? Should one have the right to share in the surplus produced by one's cells, even when those cells are not in

you body? Consider the case of Henrietta Lacks, an African-American tobacco worker who died of cervical cancer. Cells taken from her body, without her knowledge or consent, were cultured and used in all kinds of research long after her death, from the polio vaccine to AIDS treatments and gene mapping. Those cells proved not only useful for research but profitable for medical business, while her descendants could not even afford health insurance. How is one to think the molecular agencies of such a story?

The figure which it famously proposed as a node of agency is the **cyborg**, in her 'Manifesto for Cyborgs.' "Like any important technology, a cyborg is simultaneously a myth and a tool..." (PV139) It is not the labor point of view, as if labor existed independently of the apparatus with which it is entangled. It is not women's point of view, as if one could speak of it as a universal subjective perspective, existing prior to the social and technical relations in which it meshes.

Cyborgs are affinities rather than identities, hybrids of human and other organics, information systems, ergonomic laboring, producing and desiring. Cyborgs are monsters, or rather *demonstrations*, in the double sense of to show and to warn, of possible worlds. "As monsters, can we demonstrate another order of signification? Cyborgs for earthly survival!" (SCW4)

In place of the "god-trick" of speaking as if one had access to a portal to the absolute, the cyborg is a kind of ironic myth, a heretical counter-story to the human as pre-given. "Blasphemy protects one from the moral majority within, while still insisting on the need for community." (SC149) Like the Marxist-feminist critic inside the research university, the cyborg is always an insider and outsider to techno-science, which after all is pretty much the case now for all of us. "I think the way I work is to take my own polluted inheritance – cyborg is one of them – and try to rework it." (HLL103)

The cyborg isn't an innocent figure. "The main trouble with cyborgs, of course, is that they are the illegitimate offspring of militarism and patriarchal capitalism, not to mention state socialism. But illegitimate offspring are often exceedingly unfaithful to their origins. Their fathers, after all, are inessential." (SCW152) Cyborgs are a kind of orphan, even if in a more troubling sense that parentage is not lost or forgotten but never quite existed, even though "the cyborg... doesn't have a mother, but it does have a matrix." (SCW129) The cyborg is a contemporary kind of conceptual personae.

Haraway: "Too many people, forgetting the discipline of love and rage, have read the 'Manifesto' as the ramblings of a blissed-out, technobunny, fembot." (HR3) Surely this stems from the persistence of the ideological pull of the figure of nature, and an inability to think and feel through the emerging forces of production as anything other than poisoned product of techno-science.

Haraway: "From *One Dimensional Man* (Marcuse 1964)... the analytic resources developed by progressives have insisted on the necessary domination of technics and recalled us to an imagined organic body to integrate our resistance.... But a slightly perverse shift of perspective might better enable us to contest for meanings, as well as for other forms of power and pleasure in technologically mediated societies." (SCW154) Perhaps it would be possible to sense a web of human and nonhuman agents, more a mechanically and digitally reproducible compound eye than a single labor point of view.

Perhaps this point of view could be broader than that of labor, and not separate out in advance production from reproduction. Perhaps it could also include something a bit distinct from either, a kind of activity that neither produces nor reproduces, but proposes other means of doing either, or neither, or both. Could it even include the hacker class as a distinctive point of view not entirely reducible to labor? One might start here with the notion of organization, rather than production, as a 'basic' level of analysis, but look askant at its unquestioned functionalism.

There is no real traction to be gained from trying to base a critique on nature versus culture, or the human versus the machine, nor is there leverage in play versus labor. In an era where there is money to be made from all sorts of effort people put in to voluntarily creating and sharing information, then labor itself is an unstable category. Haraway: "we are living through a movement from an organic, industrial society to a polymorphous, information system — from all work to all play, a deadly game." (SCW161)

Information is more than a powerful metaphor extended via substitution into an explanatory causality for the world, or even for the cosmos. It becomes a powerful means of organizing worlds. Haraway: "communications science and modern biologies are constructed by a common move – the translation of the world into a problem of coding, a search for a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, investment, and exchange." (SCW164)

It's a matter of seeing this as at once an actuality, as an ensemble of real phenomena, and yet also as historical, as the product of certain kinds of labor, or more specifically of techno-science as a central way that power works in this stage of the commodity economy – whatever it might be.

It was prescient of Haraway to notice, and early on, that "the new communications technologies are fundamental to the eradication of 'public life' for everyone." (SCW168) The reduction of a wide range of processes, and not just labor, to a thing, or in this case to code, supports a vast extension of private property relations.

The monstrous omens Haraway detected in the late twentieth century came to pass: "A major social and political danger is the formation of a strongly bimodal social structure, with the masses of women and men of all ethnic groups, but especially people of color, confined to a homework economy, illiteracy of several varieties, and general redundancy and impotence, controlled by high-tech repressive apparatuses ranging from entertainment to surveillance and disappearance... The only way to characterize

the informatics of domination is as a massive intensification of insecurity and cultural impoverishment, with common failure of subsistence networks for the most vulnerable." (SCW169-172) And so it came to pass, only it came to be called, by Franco Berardi and others, **precarity**.

Creating any kind of knowledge and power in and against something as pervasive and effective as the world built by postwar techno-science is a difficult task. It may seem easier simply to vacate the field, to try to turn back the clock, or appeal to something outside of it. But this would be to remain stuck in the stage of romantic refusal.

Just as Marx fused the romantic fiction that another world was possible with a resolve to understand from the inside the powers of capital itself, so too Haraway begins what can only be a collaborative project for a new international. One not just of laboring men, but of all the stuttering cyborgs stuck in reified relations not of their making.

God is dead, and so too is the Goddess. The disenchanting corrosion of all that is solid into the molecular abrades more than one way. If there is no thing-in-itself, no scientific-realist absolute, then there's no prior and originary subject for a social movement, either. We are always and already insiders.

Haraway: "Feminisms and Marxisms have run aground on Western epistemological imperatives to construct a revolutionary subject from the perspective of a hierarchy of oppressions and/or a latent position of moral superiority, innocence, and greater closeness to nature. With no available original dream of a common language or original symbiosis promising protection from hostile 'masculine' separation, but written into the play of a text that has no finally privileged reading or salvation history, to recognize 'oneself' as fully implicated in the world, frees us of the need to root politics in identification, vanguard parties, purity, and mothering. Stripped of identity, the bastard race teaches about the power of the margins..." (SCW176)

What needs reworking is the struggle of labor in and against nature. Haraway: "Humanistic Marxism was polluted at the source by its structuring ontological theory of the domination of nature in the self-construction of man and by its closely related impotence to historicize anything women did that didn't qualify for a wage. But Marxism was still a promising resource in the form of epistemological feminist mental hygiene that sought our own doctrines of objective vision. Marxist starting points offered tools to get to our versions of standpoint theories, insistent embodiment, a rich tradition of critiques of hegemony without disempowering positivisms and relativisms, and nuanced theories of mediation." (SCW186)

The cyborg point of view is shaped in part by social movements around labor, race, gender, sexuality and indigenous rights. The cyborg point of view is shaped in part by the sciences, by struggles to produce objective knowledge of the world, complete with substitutions transposed into it from the dominant forms of organization.

The cyborg point of view has at least one other component: the point of view of the apparatus itself, of the electrons in our circuits, the pharmaceuticals in our bloodstreams, the machines that mesh with our flesh. The machinic enters the frame not as the good or the bad other, but as an intimate stranger. Apparatus, like sensation, is liminal and indeterminate – an in-between. It is an *inhuman* thing, neither object nor subject.

One of its special qualities as such may however be to generate data about a *nonhuman* world. The apparatus renders to the human a world that isn't *for* the human. An apparatus is that which demonstrates some aspect of a monstrous, alien world. An apparatus yield aspects, particular monstrosities, which never add up to that consistent and absolute world that is remains the God, or Goddess, of all realists.

An apparatus affords the real, material and historical form of mediation. I take up the significance of this in *Molecular Red* through a reading of Haraway's colleague Karen Barad and former student Paul Edwards, who show the centrality of thinking the cyborg-apparatus for understanding techno-science today. Elsewhere I follow the same line of thought to Paul B Prčićado. For while there has been a turn towards a revival of scientism and claims for the virtues of a universal rationality, these bypass the more difficult business of grasping how science is actually produced.

Hence the centrality today of Haraway's work, in which thinking the messy business of making science fully embraces its implication in nets of corporate and military power, its processing and reinforcing of metaphors not of its making, and its dependence on a vast cyborg apparatus. The strength of her work is in not abandoning the struggle for knowledge under such difficult conditions and retreating into mere philosophy.

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